



Kevin L. Shafer, P.E.
Executive Director

May 19, 2017

Mr. Dean Maraldo
Water Enforcement and Compliance Assurance Branch
U.S. Environmental Protection Agency
77 West Jackson Boulevard (WC-15J)
Chicago, Illinois 60604

Re: Milorganite® Fertilizer

Dear Mr. Maraldo:

The Milwaukee Metropolitan Sewerage District (District) is continuing to improve how it demonstrates compliance with the requirements for Milorganite® fertilizer. The following update supplements the information I provided in my letter dated April 7, 2017.

Temperature Monitoring

The District continues to believe that its location for monitoring product temperature, the number of temperature measurements, and the temperature results demonstrate compliance with 40 CFR Part 503 and the District's WPDES permit. Nothing in the text of the requirements mandates that the required temperature be achieved in a single pass or every pass in a multi-pass system. The critical point is that product reaches 176° F at some point in the process. For Milorganite® fertilizer, a multi-pass drying system with continuous massive recycling is necessary for achieving a product that can be successful in the marketplace. For this type of process, a reasonable interpretation of the temperature requirements would consider the performance of the drying system as a whole, instead of individual dryers.

The achievement of any particular temperature is not an end in itself. The purpose of heating and drying is pathogen destruction. A strict interpretation of the temperature requirements might be appropriate in a case where a biosolids product has significant pathogen concentrations. In contrast, Milorganite® fertilizer has a long history of pathogen concentrations below or near the level of detection. The District is not aware of any new information showing pathogen concentrations that would justify major new investments in temperature monitoring technology or significant changes in operations. However, to investigate possible improvements to the District's temperature measuring system, the District is investigating temperature measurement alternatives for both product and air, as described below.

Milwaukee Metropolitan Sewerage District

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As you saw during your visit, drying occurs in twelve rotating drums. The rotating drum extends seven feet outside the dryer furnace (heated zone). The drums discharge to screw conveyors. The constantly rotating parts and constantly moving and abrasive product make the placement of temperature sensors challenging. The District is continuing to investigate all possible options to revise the temperature monitoring system to further demonstrate compliance.

As part of this investigation, the District is contacting dryer manufacturers and water reclamation facilities with heat-dried products. So far, the District has contacted the dryer manufacturers Davenport and Andritz and the water reclamation facilities in Ocean County, New Jersey, and Louisville, Kentucky. The District would appreciate any leads the U.S. Environmental Protection Agency could provide to other dryer manufacturers or water reclamation facilities who have drying systems similar to the District's system and have temperature monitoring systems that the U.S. Environmental Protection Agency finds satisfactory.

For developing a new approach to temperature measurement, critical considerations are: (1) required temperature monitoring frequency, such as continuous, hourly, by shift, or daily; (2) how the temperature standard is to be implemented, such as absolute, hourly average, daily average and whether the standard applies at the end of each dryer or the end of the drying process, and (3) how to address dryer starting and stopping. Neither the regulations nor guidance discuss these details. Before the District can design and implement any new system, the U.S. Environmental Protection Agency must provide guidance regarding these issues.

Product Temperature Study

On eight days between March 15 and April 17, 2017, the District manually measured product temperatures at the end of the heated zone within the dryer drum. The District obtained 93 measurements. These temperatures were 191° F or higher, well above the 176° F required by the heat drying standard, and significantly higher than the temperature at the existing continuous temperature monitoring location, which is 19 feet from the heated zone. The District is investigating how a continuous product temperature monitoring system could be installed at the end of the heated zone within each dryer.

Air Temperature Study

On sixteen days between February 16 and March 13, 2017, the District manually measured air temperatures at the end of the heated zone. The District obtained 142 measurements. These temperatures ranged from 198° F to 275° F dry bulb. The District is investigating humidity measurement technologies that can withstand temperatures up to 300° F in an abrasive and dusty environment. If the District identifies suitable technology, then the District will continue to evaluate options for a system to monitor wet bulb temperature, using air temperature and humidity measurements, as an alternative to product temperature measurement.

Operating Procedure

As indicated in the April 7, 2017, letter, operators are now routinely taking manual measurements at the end of the dryer drum when the existing continuous temperature monitoring location shows a temperature below 176° F. If this measurement identifies a temperature less than 176° F, then the normal recycling of product occurs as previously described to you and your staff, and the operator will either make adjustments to increase the temperature, such as adding heat, decreasing wet feed, or increasing recycled feed; or identify a special condition, such as start-up, shut-down, or a mechanical problem.

This procedure requires additional labor and potentially increases fuel consumption and the related emissions. However, these increased costs are unlikely to be producing any consequential reduction in pathogens because the drying process was already destroying them.

Fecal Coliform Sampling Location

Several options are available for sampling pathogens:

...at the time the sewage sludge is used or disposed; at the time the sewage sludge is prepared for sale or given away in a bag or other container for application to land; at the time the sewage sludge or material derived from sewage sludge is prepared to meet the requirements in §503.10...
(40 CFR sec. 503.32(a)(7)(i))

In the Milorganite® fertilizer manufacturing process, sizing is the last operation. Currently, the District samples for fecal coliform after sizing and before storage in the silos that hold product before shipping to packaging facilities and bulk customers. After sizing, the District is only moving product, not changing it. Therefore, the existing sample point is both “at the time the sewage sludge is prepared for sale” and “at the time the sewage sludge...is prepared to meet the requirements of §503.10.” Therefore, the existing sample point complies with the requirements.

The District’s understanding is that certain U.S. Environmental Protection Agency staff desire a sampling point for fecal coliform immediately before shipping. Despite an existing sampling point that already complies, the District will move the sampling point for fecal coliform to the loading facility and sample while loading trucks or railcars, which is immediately before the product leaves the facility. The enclosed schematic diagram shows the existing and new sampling points.

Fecal Coliform Analysis Holding Time

To continuously confirm product quality, the District has analyzed three samples per month for fecal coliform. The District collected these samples in the first three weeks of each month and then analyzed them together. The District implemented this practice in response to the 90-year history of consistency and stability of Milorganite® fertilizer and the desire to achieve economies

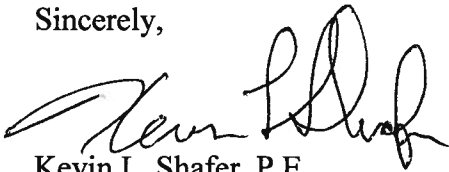
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of scale in the laboratory. A delay in analysis allows time for pathogens to grow, potentially biasing the samples in favor of higher pathogen concentrations. Despite this potential for results to be biased high, fecal coliform concentrations have been consistently near or below the level of detection, far below the limit of 1,000 MPN/gTS. As the method for fecal coliform notes, Milorganite® fertilizer is so stable that it is used as a standard for the method (U.S. Environmental Protection Agency, *Method 1680: Fecal Coliforms in Sewage Sludge (Biosolids) by Multiple-Tube Fermentation Using Lauryl Tryptose Broth (LTB) and EC Medium*, sec. 7.11, April 2010). Thus, the District's practice allowed efficient use of laboratory resources, while presenting accurate information regarding the condition of the product.

However, the District understands that certain U.S. Environmental Protection Agency staff desire that the fecal coliform analysis begin within eight hours of sample collection. In response, the District will change its practices as requested. The District will sample once per month, as required by 40 CFR 503.16(a)(1), Table 1, and start the analysis within eight hours of sample collection.

District staff is available at any time to answer any additional questions you may have. Thank you for your consideration.

Sincerely,



Kevin L. Shafer, P.E.
Executive Director
Milwaukee Metropolitan Sewerage District

enc.: Schematic Diagram Showing Existing and New Fecal Coliform Sampling Points

c: C. Korleski (U.S. EPA)
B. Hartsook (WDNR)
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Existing and New Fecal Coliform Sampling Points

Typical Biosolids Process Day

% TS and Mass (Dry tons per day)

